Fényes, Hajnalka: Gender Differences in High School and Higher Education School Efficiency in a Borderland Region of Hungary, and the Male-Disadvantage Hypothesis[1]

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Many presume that women are in a disadvantageous situation; however, there are diverse aspects in education showing different results. The girls are in majority in general high schools and in higher education in Hungary and other developed countries, as well (Róbert (2000), and Székelyi et al. (1998), Bae et al. 2000, Freeman 2004). In our previous research we have also examined the social background of boys and girls in general high schools and in higher education (Fényes, Pusztai 2006, Fényes 2008a). According to this, we can trace a typical self-selection at boys who are in minority in general high schools and higher education; they only attempt to study further based on their more advantageous cultural and material background. Therefore, besides their rate in education, they are in disadvantage compared to the girls in this respect, as well (this will be the so-called *male disadvantage hypothesis* expounded later on). International studies also assert that girls have greater social mobility in higher education (Buchmann, DiPrete 2006).

Nevertheless, certain results draw our attention to the disadvantageous educational situation that still exists in the case of women. For example we can find vertical- and horizontal segregation by genders in higher education (see the works of Jacobs 1999, Bradley 2000, Charles, Bradley 2002), which may put women in disadvantage. This paper, however, discusses the field of education where we can find the relative advantage of girls. We are trying to find the answer to the question what the school efficiency of boys and girls in secondary and higher education is like, and how this is affected by the cultural and material background of students.

The background of efficiency examinations

Our research questions - in this part of the article - are how school efficiency can be measured, what affects efficiency, which gender is more efficient in school and what can the reason be for the greater efficiency of girls in high schools.

Measuring efficiency

There is no common consent for the measurement of educational efficiency. The international examinations do not only measure the end-product but the output, as well, which is based primarily on student efficiency. Thus, they compare the start and end points. The newer efficiency examinations monitor both student efficiency and teacher-student relationship and the role of school leadership. Besides, the "added value" research examines the effects of student composition of schools (classes) on the efficiency of schools, as well. (Lannert 2004)

[1] The empirical part of the study is based on the research, NKFP-26-0060/2002 "Regionális Egyetem" ("Regional University") and the OTKA (T048820) "Középiskolások továbbtanulási tervei egy határmenti régióban" ("Plans for further studies at high school students in a borderland region"). Herewith, I would like to say thanks to Gabriella Pusztai, and Tamás Kozma for letting me take part in the research and for providing my work with their useful pieces of advice.

According to other researchers, school efficiency is also indicated by the rate of students studying further at higher education (besides students' performance) and the integration with the labor market. Other efficiency indexes can be high school leaving exam results, scores obtained at higher education entrance exam and success at student competitions. (Horváth, Környei 2003)

As we have mentioned above student efficiency is also a segment of school efficiency. In the empirical section of this paper we have examined the secondary- and tertiary level efficiency of students of different genders – within the boundaries of a questionnaire. Our efficiency indexes on secondary level (in general high schools) are the students' possession of a language exam certificate, their participation at student competitions, students' performance averages and finally, plans for studying further. On tertiary level, the technique of measuring may not be as expanded as in the case of secondary education.[2] Besides the efficiency indexes referring to former studies (final examination results at high schools and scores obtained at higher education entrance exam), this paper examines the possession of the language exam certificates, plans for further studies after the university, plans for PhD training, the possession of State Scholarship (granted to the students with the best performance by the President of the Republic), publication activity during the studies, student competition activity, special college student status, study trips abroad and teaching activity during the studies, as well.

The role of factors affecting efficiency

The famous "Coleman Report" (Coleman et al. 1966) was the first to discuss what the role of within school factors is in the differences between students' performance, but according to the early results, the effect of the school in student efficiency is negligible; rather, it was the family background and the individual abilities of students to make a difference. However, according to newer PISA tests and other examinations, as well, the differences between the performance of students are also explained by the quality of teaching and the social composition of student groups. Therefore, the so-called contextual effects are also important. The material background (outward resources) of the school may also count, and the availability of resources within the school may be significant, as well (Alexander, McDill 1976).

In Hungary, family background has a respectable role in one's education and qualifications – it is the greatest among the OECD countries. Efficiency is explained by the social background of students at 42%, and the factors that can be influenced by the school only explain 5%. (Horn, Sinka 2006) (We have to note that when these figures were calculated there were some methodological problems, so we have to be cautious with these data.)

In another study of ours, we researched the contextual effects on student efficiency in a borderland region of Hungary (Fényes 2008b). According to our results, the rate of students per classes/schools who have highly educated parents affects student efficiency, and primarily the efficiency of students with not highly educated parents. Therefore, where the rate of highly educated parents was small, the students with highly educated parents performed better, and where this rate was high, the children of not highly educated parents have better

[2] Pusztai (2007) measured the efficiency of students in higher education with five separate indices: further study plans, extracurricular workload index, attitude to high culture (time spent on reading), altruistic attitude to work and finally the inclination to start working (start working as soon as possible).

results. We also found positive contextual effects with respect to religious relationship resources of the students.[3]

School efficiency of male and female students

As long as physical power had played a dominant role in society, women had no chance for equal rights. However, the mental abilities of females are not worse than those of males, moreover, their school performance is better. The language learning ability and verbal skills of women exceed the similar skills of boys, but boys have better spatial abilities, logical and counting skills and technical abilities, although these differences decrease with ageing. According to Czeizel, women do not have lower intellectual abilities; it is their social opportunities that are more limited. (Czeizel 1985)

It is important to remark that the distribution of the intelligence values of males is flatter; and the number of men with exceptional abilities or a mental handicap is higher.[4] The test results show, that there is considerable male advantage at the high scores, except for reading and text comprehension, and this phenomenon is permanent in time. (At the low scores the case is inverse.) (Nowell, Hedges 1998).

In the field of basic abilities and competence, girls are improving compared to boys. The cognitive abilities of girls exceed the abilities of boys at the end of primary school, already. In the 1980's, researchers (H. Sas 1984) already spotted that girls were able to perform better even in the field of abilities mostly preferred by boys.

Based on the American data of the 1960's, researchers have shown that women have altogether better results in high school, even if they filter out the effect of the family background, abilities, skills and the choice of preparatory course for higher education entrance exam. Girls also tend to have better educational self-concept. They only lagged behind in the field of mathematics results. (Alexander, McDill 1976)

Today, even the mathematics results of girls are better than those of boys, and in the U.S. and other developed countries we find an overall better high school performance of girls according to GPA (Grade Point Average) indexes. (Perkins et al. 2004, Clifton et al. 2008) The 1991 and 2001 data of the OECD countries also show that the elementary and high school performance of girls is better than that of the boys. Other researchers have demonstrated that, in the 1990's, tests showed a slight male advantage (and the differences hardly changed with the lapse of time (Hedges, Nowell 1995)), but with respect to grades, girls were already in the lead in the 1950's and 1960's (Buchmann, DiPrete, McDaniel 2008).

One of the efficiency indexes is the ambition of studying further in higher education. In the U.S. in 1980 the rate of further study plans was similar in case of girls and boys, however, in 1996 these rates were already divergent: 60% of girls and 49% of the boys intended to undertake further education. In addition, girls often start their further studies directly after

[3] In classes where the number of churchgoers was small, the students not going to church were more efficient. In classes where this number was high, the churchgoers were more efficient. Presumably, this is the stimulating effect of denominational schools on the efficiency of churchgoers. It is notable that the religious relationship resources of parents – churchgoing and the religious group of friends – did not affect student efficiency, either on individual or on group level.

[4] The reason for the higher rate of men with exceptional abilities can be that these tests were primarily invented by men and for men. (Czeizel 1985)

high school, and they are also more perseverant, and finish their tertiary level studies at a higher rate. (Bae et al. 2000) According to the 2003 Hungarian results, girls were also in the lead with a 64% of them intending to study further as opposed to the 58% rate of boys. It is remarkable, though, that when not accepted, girls would choose the option to retry application process at a greater rate, while boys would attempt to choose some sort of profession. If we do not only consider these plans, girls were also accepted in higher education at a greater rate, while many boys did not even attempt to study further (the self-selection of boys), or were not accepted. (Liskó 2003)

As we have already noticed, girls today have better grades on all school levels; therefore their tertiary level efficiency is also greater (Buchmann, DiPrete, McDaniel 2008). According to certain Canadian data from 1997, there was a 7% difference for the advantage of girls in tertiary level institutions in higher education performance, but this difference was not significant. Nevertheless, girls studying in higher education proved significantly better in the fields of text comprehension, debating skills, and strategies for success. (Clifton et al. 2008)

Gender differences of competence areas

If we look at the competence areas, girls are in a lead at reading- and text comprehension according to the PISA 2000 test – both in Hungary and in the OECD countries. A slight male advantage can be detected in mathematics and sciences, but the difference is only significant in half of the OECD countries, and it decreases in time (Freeman 2004). Other data also indicate significant gender difference in reading, but not in mathematics (Marks 2008). Hungarian analyses show that girls are better at reading and text comprehension, and that there is no gender difference at mathematics (Horváth, Környei 2003). According to recent PISA studies, differences in performance on the fields of competence between girls and boys are considerably smaller in Hungary than in other countries (Keller, Mártonfi 2006).

American researchers encountered divergent results at early reading abilities according to social status. Among students with a disadvantageous background, the girls had better reading abilities, but gender differences disappeared at students having better social background. (Entwisle et al. 2007) It is but an interesting phenomenon to see that even according to Hungarian data, the difference between the performance of boys and girls decreases with the increase of the qualification of parents (Vári et. al. 2000).

Based on the data of 19 countries from the years 1964 and 1982, we can state that gender differences decreased with the lapse of time in mathematics test results and grades, and the difference is smaller in those countries where girls are represented in higher education at a higher rate and their prospects for work are better. There are countries where girls had better results in mathematics as early as 1982 (Finland, Hungary, the French part of Belgium and Taiwan). (Baker, Jones 1993)

Interestingly, results in mathematics do not differ by gender in the first years of studies, and gender differences appear later on (Bae et al. 2000, Freeman 2004). The background to the slightly weaker mathematical performance of the girls may be that the attitude to mathematics and confidence in one's mathematical knowledge are different by gender. Women are less interested in mathematics and are less confident in their mathematical knowledge. (Catsambis 1994) Therewith, according to numerous psychological examinations, the background to the weaker mathematical performance of girls can be found in gender stereotypes, gender

socialization, and not in weaker abilities and biological features (Spencer et al. 1999, Spelke 2005).

The mathematical results of our times hardly deviate from each other by gender in 6th and 12th grade, but girls are less interested in mathematics and therefore few girls choose to study mathematics and sciences in higher education. Many researchers suggest that careers on these fields of interests have to be made more attractive for girls, and it is not the problem in the results that needs solving. (Liver et al. 2002)

The divergence in the choice of courses in high schools is also important. In the 1980's, less women chose advanced level mathematics courses in the U.S. Girls only accomplished the minimum (in mathematics and sciences) that was necessary for entering higher education. (Mickelson 1989) In our time, however, girls tend to choose mathematics classes at the same rate, and the choice of courses is becoming more similar at boys and girls (horizontal segregation is decreasing) (Buchmann, DiPrete, McDaniel 2008). Advanced level mathematics courses are chosen by boys and girls at the same rate, and the differences in performance rather depend on attitudes than on the choice of courses. (Bae et al. 2000, Freeman 2004)

The possible causes of the greater high school efficiency of girls

Besides knowledge, the other important feature in school is diligence, as opposed to creativity or quick wit which is mainly characteristic of boys. Girls are more diligent and tend to memorize more, while boys strive to find correlations between knowledge items. Considering all, we can observe that the study methods of girls are more efficient, and that they are more successful in elementary and high schools. (Rostás, Fodorné 2003) Hungarian students are on the top of the OECD country rank with respect to rote learning. Hungarian girls have a remarkable "cramming technique" which is way above the OECD average (Horváth, Környei 2003).

While there is hardly any gender difference in cognitive abilities, the grades of boys are worse, and their rate of absence is greater in school. Some think that the cause of this is found in the differences between non-cognitive abilities. Boys are less capable of paying attention in school, and find it harder to work in a group. They are less helpful, and cannot go along with homework and other school materials as efficiently as girls. This may also affect the further study plans of boys in a bad way – via their worse school results. (Jacob 2002) Boys have more problems with reading, and girls tend to have better social skills and behavior in the class. Girls also relate to studying more positively and their non-cognitive abilities are better. (Buchmann, DiPrete, McDaniel 2008) Besides these, girls take part in extra-curricular activities (except for athletics) more frequently (e.g. cultural activities, working at the student self-government) (Bae et al. 2000, Freeman 2004).

The greater self-discipline of the girls also leads to higher efficiency in school (Duckworth, Seligman 2006). Another reason for higher efficiency may be the fact that parents deal with their daughters (e.g. in the case of mathematical difficulties) during their studies rather than with their sons (Muller 1998).

A further reason for the better school efficiency of girls may be their will to meet the requirements, to be a good student, to accomplish what parents and teachers expect them to do (H. Sas 1984). This can originate from the differing gender role socialization. Men find it

important to acquire professional knowledge and other intrinsic rewards. They also have better self-confidence, but girls aim to acquire social appreciation and other external approval. (Mickelson 1989)

It is an interesting question what correlation we can find between the high rate of female teachers and the better results of girls. Girls would like to be like their female teacher; this helps their assimilation in the school and their adaptation to school life (Rostás, Fodorné 2003). Boys do not consider school life and the requirements masculine enough, and rebel against the educational system mediated by women. Nevertheless, there are opposing opinions, as well, saying that the female teacher pays more attention to the male student, and we can find the respect of the opposite sex. Researchers also argue whether boys perform better if the teacher is a man (Buchmann, DiPrete, McDaniel 2008).

The cause of higher female efficiency may be the fact that girls tend to study with greater pleasure – as opposed to boys. In second grade of elementary school, boys feel that they succeed more easily, think that they are brighter than girls, tend to be more content and like going to school. Fourth graders, however, learn that discipline makes it easier to adapt to school life and girls seem to be better at this than boys. By this time, girls love going to school and learning more than boys do, and also consider themselves more diligent (Rostás, Fodorné 2003)

There is a question also, how the coeducational or non-coeducational education form affects the efficiency of boys and girls. According to some researchers, segregated training in higher education is advantageous to girls. They reason that in the 1960's and 1970's there was a great number of famous women (physicians and researchers) graduating at female institutions in the U.S.. However, the lack of the filtering of social background and selection is the fault of this research, since these schools are predominantly attended by the daughters of high-status parents, and female students in these institutions are rather career-oriented. Thus, these two factors could be the reason for their success later in life. (Jacobs 1996) The statement that coeducational schooling would be of positive effect for male student efficiency in high schools and of negative effect for female efficiency did not gain verification, either. Coeducational schooling did not affect Mathematics and English results either in a positive or negative manner (male advantage in Mathematics and female advantage at English remained). (Smith 1996)

Another cause of the higher female efficiency may be that girls have greater cultural activity. According to DiMaggio's (1982) examinations, the cultural capital of girls is significantly higher than that of boys. The author draws our attention to the fact that cultural interest and practice are culturally expected from girls. However, this is less characteristic of boys, moreover, it may trigger negative sanctions from their peers. Because of the career opportunities and all its inherent financial advantages monopolized by men, girls find it more important to excel on cultural-type markets. Further reason for the higher cultural capital of girls is that "women who wish to be recognized as eligible partners for man from high status background may need cultural capital to a greater extent than man who wish to achieve in the world of work" (DiMaggio 1982, 198).

Hungarian girls also display greater cultural interest than boys do; girls tend to have greater cultural consumption and read more (especially more belles-lettres – for data see also Fényes 2006, 2008a). According to DiMaggio, abilities and the family background on their own have but little influence on school grades, but the cultural capital of the students may have a greater

effect. Based on his results, the effect of cultural capital on non-technical subjects approximates that of the assessed abilities. According to Bourdieu (1973), students in the school are rewarded based on their cultural capital and since the girls' cultural capital (where the parental cultural background was not included) is significantly higher (either in high school or during the first years of higher education – see Fényes, Pusztai 2006, Fényes 2008a), this may be a reason for their greater efficiency. It is also noteworthy that, according to DiMaggio's (1982) American finding from 1960, the results of female students with parents of higher education were affected by cultural capital to a greater extent (cultural reproduction model is present here). Meanwhile, this was true for the results of male students whose parents had lower educational qualification (cultural mobility model is present here). It is important to note that DiMaggio examined the cultural resources of students and neglected the resources of parents. His results show that the positive effect of the cultural resources of students on school efficiency will still prevail even after the filtering of the effect of individual abilities and social background. Dumais (2002) also establishes that cultural capital has a positive traceable effect on the grades of girls, while this effect is weaker in the case of boys. Because of traditional gender roles, girls tend to show greater cultural activity and their success in school is more impelled by cultural capital.

Hypotheses

According to our hypothesis, girls are definitely more efficient on secondary level education (in general high schools), which could be expected based on other research results, as well. We can state that secondary level education was developed for girls – they are more diligent, successful and efficient than boys. Female students in high schools presumably gain better performance averages, obtain more language exam certificates, participate in greater number at student competitions and besides, more of them plan to study further in higher education for a longer period of time. Therefore, they will be more efficient than boys.

In higher education, however, this is not so evident. Based on the studies of Jacobs (1996) we have to differentiate the three phases of training. At entering higher education, the advantage of girls could be seen (better final examination exam results at high school, greater admission-rate, and more language exam certificates). However, during the years spent in higher education the advantage of boys could be traced in certain indexes (publication and teaching activities during the studies, student competition activity, special college student status), although girls can still prove to be better in some other indexes. Considering the output of higher education (success on the labor market), boys are already in the lead. Presumably, we will find vertical segregation appearing during the training, i.e. the plan for PhD studies will be present at boys at a greater rate.

At the examination of efficiency in higher education we also investigated how the differences found in the cultural and material background of boys and girls affect efficiency indexes. (We have carried out these tests with multi-variable methods.) According to our hypothesis related to the background of students (*male disadvantage hypothesis*), there is a self-selection of boys at higher education, boys have better cultural and material background, their social mobility is lower and therefore we can state that they are in disadvantage compared to girls. The cultural resources brought from the family background (e.g. parents with higher education) will be greater for those boys who get into higher education. In addition, their material capital will also be higher, prospectively, and they will come from more advantageous type of locality. According to the results of Bukodi (1999), it was the cultural reproduction model to be

realized for girls in Hungary in 1995 (i.e. the greater cultural capital of parents led to further studies). For boys, she found that the rational decision theory model coming true; they merely attempted to study further by using bigger material capital. Nevertheless, we presume that boys studying in higher education will have higher material and cultural capital, as well. It is a question to be answered, therefore, whether the greater efficiency of boys (in certain indexes) is merely the outcome of their better background or not.

Databases

We used two databases of the so-called "Regionális Egyetem" (Regional University) research (led by Tamás Kozma) in the analysis: the ISCED51 (full-time first year students at college and university N=1587) and the ISCED54 (fourth year full-time students at college and university N=940) databases. Both samples are regional and relate to the Partium region (a borderland region of Hungary). The questioning took place in the Hungarian-speaking tertiary level institutions of three countries (Hungary, Romania and Ukraine), and the sampling took place between 2003 and 2005.

At the efficiency of high school students we used the database of the OTKA research (led by Gabriella Pusztai) titled „Középiskolások továbbtanulási tervei egy határmenti régióban" ("Further study plans of high school students in a borderland region"). The sampling took place in the Partium region as well: high school seniors were questioned in Hungarian schools and Hungarian-speaking schools beyond the border. The size of the sample was N=1446 among which 675 students attended denominational schools and 771 attended non-denominational ones. The sampling took place in the spring of 2006.

Results on efficiency (by using cross tabulation and without filtering the background)

Firstly, we analyzed the efficiency of male and female students in (general) high school. Within the limits of the questionnaire, we measured efficiency by the possession of language exam certificates, participation in student competitions, students' performance averages and the plans for studying further. The members of the sample were students of general high schools in 90%, and 60% of them were girls. The data were available in two segmentations: denominational/non-denominational schools and Hungarian institutions/institutions beyond the border. (The rate of girls was around 60% in all four institution types.) In the following, we will use summarizing tables which are based on the cross tabulation runs of the SPSS program and the values of the Chi-square statistics.

Table 1.
The efficiency of boys and girls in denominational and non-denominational high schools, in a regional sample

Efficiency	**Denominational students N=675**	**Non-denominational students N=771**
Language exam certificate	Girls in the lead	NS
Student competition activity	NS	Girls in the lead
Students' performance averages	Girls with better averages	Girls with better averages
Plans for further studies	NS	Girls in the lead
Length of further studies	NS	Girls plan to study longer

NS (also in the upcoming tables) marks non-significant relations by gender.

Table 2.
The efficiency of boys and girls in Hungarian high schools and institutions beyond the border, in a regional sample

Efficiency	**Hungarian students N=868**	**Students beyond the border N=578**
Language exam certificates	Girls in the lead	NS
Student competition activity	Girls in the lead	NS
Students' performance averages	Girls with better averages	Girls with better averages
Plans for further studies	Girls in the lead	Girls in the lead
Length of further studies	Girls plan to study longer	NS

Our hypotheses on the efficiency of boys and girls were mainly realized; the advantage of girls is traceable on the secondary level (in general high schools). However, there were differences based on whether the students attended denominational or non-denominational schools, Hungarian schools or institutions beyond the border, but no boy advantage was detectable at any of the efficiency indexes we had measured (language exam certificate, student competition activity, students' performance averages, plans for further studies). All things considered, girls were either more efficient on secondary level or there was no significant difference in the indexes by gender. It can also be shown that boys performed worse than or the same as girls, despite that their cultural and material background was better (see Fényes 2008a).

We should now consult the cross tabulation results we got on higher education:

Table 3.
The efficiency of boys and girls in higher education, in a regional sample (cross tabulation results)

Efficiency	**First year students (ISCED51) N=1587**	**Fourth year students (ISCED54) N=940**
High school leaving exam results	Girls in the lead	Girls in the lead
Entrance exam scores	NS	NS
Language exam certificate	Girls in the lead	NS
Further study plans	NS (girls)	Girls in the lead but mostly in colleges
PhD plans	No data	Boys in the lead
Student competition activity	No data	More boys plan it
Publications	No data	Boys in the lead doing and planning

Considering efficiency, the situation is not so obvious on tertiary level. The better high school results and better high school leaving exam results of girls lead to greater attendance in higher education; therefore girls are in the lead at entering the institution. However, by the fourth year fewer girls have done publication activity and fewer plan student competition activity compared to boys; thus, their efficiency decreases. Vertical segregation also emerges as fewer girls plan PhD training compared to boys. Although girls tend to undertake studies after

graduating on tertiary level at a greater rate compared to boys (they strive to be versatile), they plan to study at another college or university and not at the PhD training. We can also notice that – according to the cross tabulation runs – girls participate in special college activity, teaching activity during the studies, study trips abroad, and get State Scholarship during their university studies at the same rate as boys do. (We will now omit to show the results.)

Regression results on efficiency in higher education, before and after filtering out the social background

In this section, one of our examination methods is linear regression on a composite efficiency index (how gender affects efficiency on tertiary level before and after the inclusion of social background). The other method is the application of logistic regressions on each of the nine efficiency variables (how gender affects each efficiency variable before and after the inclusion of social background).

Results on background

At first, we will introduce our former results (Fényes, Pusztai 2006, Fényes 2006) concerning the social background of college/university students of different genders.

In the case of first year college and university students (ISCED51 database) the parents of boys were more educated, their material background was more advantageous, and the locality type they were coming from was of a more auspicious type. Thus, the male disadvantage hypothesis formulated above turned out to be mostly fulfilled. In the fourth year database, however, the qualification of parents of boys and girls became similar (because of the educational expansion or the drop-out). The locality type of the place of residence of girls became similar to that of boys (girls may have moved by fourth year), and the "only" advantage remaining for boys was their better material background. When interpreting the phenomenon, we rely on the rational decision theory model (the male disadvantage hypothesis gains ground only in relation to material background, in accordance with Bukodi's (1999) results from 1995.) The wealthier families of the boys that are in minority in post-high school training, were able to undertake further schooling, although, girls appear in higher education even with less advantageous material backgrounds. Besides, it is assumable that those boys and parents who had a material background similar (disadvantageous) to that of girls, rather chose vocational schools after primary school because of their lower costs (e.g. finding jobs faster).[5]

Our results can be supported by international studies (USA), as well (Buchmann, DiPrete 2006). Girls there are also in majority in higher education compared to boys, and the ambition for further studies showed decreasing tendency primarily at the sons of parents with secondary or lower education. Meanwhile, this ambition increased at girls who had similar backgrounds. We can trace the greater social mobility of girls, therefore male disadvantage hypothesis gained ground regarding the cultural background according to U.S. data, as well.

[5] We have also examined the gender differences of relationship resources in a former study of ours (Fényes – Pusztai 2006). According to our results, boys neither obtain weak ties to higher echelons of society nor strong and tight ones to the same extent as girls do, thus male disadvantage (the better background in the case of relationship resources) was not realized in this case. (We will not discuss the effects of relationship resources on efficiency further on – that could be the theme of another study.)

Regression results on efficiency

In this section, we dealt with the fourth year college and university student database (ISCED54), since there was the opportunity to measure the efficiency for more variables, than in the first year database. Besides, it was an important aspect to consider that the effect of high school is presumably strong at first year students, while by the fourth year we were able to examine tertiary level efficiency.

Our dependant variables are the possession of language exam certificate, plans for further studies, participation in study trips abroad, PhD plans, student competition activity, publications, State Scholarship, special college student status, and student's teaching activity during the studies[6]. In addition, we created a composite efficiency index (the sum of the nine dichotomic variables[7]), as well.

Our explanatory variables are[8]: Sex, material background principal component (its components are the possession of durable consumer goods (objective material index), the subjective material background variables called "standard of living better than 10 years before" and "possible financial problems"), the number of siblings, the education of parents (measured by the number of years completed in education), reading habits of parents and student (whether the parents or students read, the number of their books is above average and whether the student has read above average in the year that passed), the cultural consumption principal component (its components are theater, museum, art movie and concert attendance (if it was above average)), the objective cultural capital index (12 values added: the possession of encyclopedias, dictionaries, books in a foreign language, books an art, classical music records, paintings per students and their parents (0 if they have none or one, 1 if they possess more than one of these)).[9]

At first, we examined the effects related to the composite efficiency index - by using linear regression. We included the variables in several steps. Firstly, we included sex only, then sex and the material background indexes (here we included each component of the material background principal component separately). Finally, we included the cultural background indexes, as well. Here we will only show the results of the last step, as in the other cases the effects were not significant.

Table 4.

[6] Since student competition activity, publications, State Scholarship, special college student status and student's teaching activity were characteristic of very few students, the small number of items made us perceive the actual and planned values merged, and that is how we created our dichotomic variables (1: the student has it or plans it, 0: does not have it and does not plan it).

[7] At each component of efficiency if the answer was missing, we interpreted it as a "no", as well. That is how we added the nine dichotomic variables.

[8] We did not include the type of locality, as that is not a continuous variable. In Robert's (1991) examination we found it highly remarkable that the type of locality did not belong to either the material background or the cultural background, or, that it was rather closer to the cultural capital indexes (according to the result of factor analysis). The reason may be that cultural consumption and type of locality in Hungary correlate very strongly, as we can find e.g. theaters or concert halls only in greater cities.

[9] At the measuring of the cultural capital we took into consideration the works of Bourdieu (1973, 1986) De Graaf (1986, 1989) DiMaggio (1982), and DiMaggio and Mohr (1985). DiMaggio (1982) only viewed the effect of the cultural resources of students on efficiency; however De Graaf (1986, 1989) examined parental background, as well. We checked both effects on the composite efficiency index, but our goal at each efficiency index was to examine the effect of gender before and after the filtering out of parental background. Thus, only the cultural resources of parents are represented in that case.

Linear regression results on the composite efficiency index (N=940)

	B	Std. Error	Beta	Sign.
Constant	1.92	0.76		0.01
Sex	-0.16	0.22	-0.05	0.47
Objective material index	0.01	0.06	0.01	0.90
Possible financial problems	0.45	0.24	0.13	0.06
Standard of living better than 10 years before (dich.)	0.21	0.22	0.06	0.34
Number of siblings is above average	0.07	0.23	0.02	0.76
Qualification of the mother	0.01	0.06	0.01	0.92
Qualification of the father	-0.05	0.06	-0.07	0.38
Whether the mother reads regularly	**-0.54**	**0.23**	**-0.16**	**0.02**
Whether the father reads regularly	0.05	0.21	0.01	0.83
Number of books at parents is above average	0.01	0.24	0.00	0.97
Objective cultural capital index	**0.08**	**0.04**	**0.15**	**0.04**
Cultural consumption principal component	**0.44**	**0.11**	**0.25**	**0.00**
If the student reads	0.20	0.24	0.05	0.42
Number of books at student is above average	0.40	0.25	0.11	0.11
The amount of reading in the past year (under or above average)	0.08	0.26	0.02	0.76

R-square=0.158, adjR-square=0.105. We bolded the figures of the effects that were significant (significance smaller than 0.05 according to the t-statistics).

According to our results, the sex of students did not affect the composite efficiency index, either in itself or after the inclusion of the background (girls are not more efficient in higher education). Efficiency "merely" depends on the reading habits of mothers (peculiarly in a negative way, which can be explained by the fact that mothers read mostly popular literature Pusztai (2009)), cultural consumption, and on the objective cultural capital index.

We can see that cultural consumption (frequency of theater, museum, art movie and concert attendance) and the possession of encyclopedias, dictionaries, books in a foreign language, books an art, classical music records, paintings (objective cultural capital index) affected student efficiency positively, in accordance with the results of Bourdieu (1973) and DiMaggio (1982).

Let us now consider the effects on each component of efficiency index, measured by logistic regression. The aim of our analysis was not the mapping of all the variables affecting further studies (and other efficiency indexes), only the examination of the effect of sex before and after the inclusion of social background. Therefore, we will not discuss the effect of the background variables in details.[10]

Girls in advantage

[10] We also indicate the fit-index of the regression models (the decrease of -2LL in per cent), which are quite low in all cases, but since the aim of this research is the proving of the effect of a variable (sex) on another variable (efficiency), the examination of this index does not specifically concern our analysis.

At first let us see how gender affects further study plans after the university/college.

Table 5.
Logistic regression Exp(B)'s on the further study plans after university/college, by including the material and cultural background indexes in separate steps (N=940)

Constant	0.752***	0.81	0.646
Sex	0.706*	0.703*	0.553**
Material capital principal component		1.185*	1.065
Number of siblings		1.137	1.346
Qualification of the mother			1.04
Qualification of the father			0.951
Whether the mother reads regularly			1.254
Whether the father reads regularly			1.063
Number of books at parents is above average			1.317
R_L^2	0.005	0.009	0.025

We marked the significance of the Wald statistics beside the Exp (B) values. *** marks significance below 0.000, ** marks significance between 0.001 and 0.01, * marks significance between 0.01 and 0.05. R_L^2 marks the fitting of the model (the decrease of -2LL in percentage).

Before and after the inclusion of the background we find that the further study plans of girls are greater (the Exp(B) regression coefficient is between 0 and 1), and the relation is rather strong. One of our former results is therefore verified: it is more characteristic of girls to be versatile and they plan to acquire (an)other degree(s) after acquiring their first one. However - as we will see - this means planning another college or university degree and not planning PhD training. Besides sex, it is only the material capital principal component that affects further studies (and it affects them positively), although after the inclusion of cultural background indexes this effect disappears.

Let us now see the gender differences of the possession of language exam certificate:

Table 6.
Logistic regression Exp(B)'s on the possession of language exam certificate, by the inclusion of material and cultural background indexes in separate steps (N=940)

Constant	1.003	1.259*	0.128**
Sex	0.841	0.798	0.582*
Material capital principal component		1.354***	1.165
Number of siblings		0.681*	0.618*
Qualification of the mother			1.109
Qualification of the father			1.109
Whether the mother reads regularly			0.73
Whether the father reads regularly			0.87
Number of books at parents is above average			1.153
R_L^2	0.001	0.022	0.052

We marked the significance of the Wald statistics beside the Exp (B) values. *** marks significance below 0.000, ** marks significance between 0.001 and 0.01, * marks significance between 0.01 and 0.05. R_L^2 marks the fitting of the model (the decrease of -2LL in percentage).

According to our results, girls have a bigger chance to acquire a language exam certificate, but the effect gains ground only after the inclusion of all background indexes. The chance of girls to acquire a language exam certificate with a worse background is similar to that of boys, but if we filter out the effect of a worse background, the advantage of girls becomes traceable (male disadvantage hypothesis is verified indirectly). It is also straightforward that the material capital (principal component) affects the chance for acquiring a language exam certificate positively, although only in the second step of index inclusion. Similarly, as it was presumable, the effect of the number of siblings is negative.

Let us now see the participation in study trips abroad. We can find the slight advantage of girls again, but the relation is not significant. (In this respect we will omit to present the data.)

Boys in advantage

Let us now see gender differences of the actual and planned publication activity during the studies.

Table 7.
Logistic regression Exp(B)'s on actual or planned publications, by the inclusion of material and cultural background indexes in separate steps (N=940)

Constant	0.375***	0.348***	0.151**
Sex	1.607**	1.652**	1.582*
Material capital principal component		0.894	0.882
Number of siblings		1.56*	1.725*
Qualification of the mother			1.023
Qualification of the father			1.034
Whether the mother reads regularly			0.951
Whether the father reads regularly			0.954
Number of books at parents is above average			1.108
R_L^2	0.009	0.016	0.019

We marked the significance of the Wald statistics beside the Exp (B) values. *** marks significance below 0.000, ** marks significance between 0.001 and 0.01, * marks significance between 0.01 and 0.05. R_L^2 marks the fitting of the model (the decrease of -2LL in percentage).

The chance for actual and planned publications is 1.5 times greater for boys and this effect remains even after filtering out the better background of boys (the effect decreases slightly). As we have already noted, we were not able to assess the gender differences of the chances for actual publications because of the small number of items. Thus, it is possible that the advantage of boys is only present in the planning of publication activity. It is most interesting; however, that this "self-confidence" is not merely due to their better background as their advantage remains even after filtering out of the background. We can also detect a peculiarity – that the chance for the possession of publications increases with the increase in the number of siblings (which would normally mark worse financial situation). The possible reason for this could be that because of the expansion in higher education in Hungary the qualification of siblings could be higher than that of parents, and the students can be motivated by these siblings to come up with publications.

Let us now see the gender differences of actual and planned special college student status:

Table 8.
Logistic regression Exp(B)'s on actual or planned special college student status, by the inclusion of material and cultural background indexes in separate steps (N=940)

Constant	0.143***	0.12***	0.109*
Sex	1.411	1.721*	1.642
Material capital principal component		0.78*	0.812
Number of siblings		1.538	1.469
Qualification of the mother			1.045
Qualification of the father			0.956
Whether the mother reads regularly			0.839
Whether the father reads regularly			1.467
Number of books at parents is above average			1.11
R_L^2	0.004	0.022	0.02

We marked the significance of the Wald statistics beside the Exp (B) values. *** marks significance below 0.000, ** marks significance between 0.001 and 0.01, * marks significance between 0.01 and 0.05. R_L^2 marks the fitting of the model (the decrease of -2LL in percentage).

The chance for actual and planned special college student status is 1.7 times greater for boys again, and this effect is significant only after filtering out the better material background of boys. Boys are not only in advantage because of their better background indexes. In a peculiar way, the material capital principal component affected the chance for actual and planned special college student status in a negative way. In accordance with experience the rate of students with worse material background in special colleges is quite high. This can be due to (1) the financial benefits of the special colleges, and (2) the better results of students with worse material background in higher education, which may be the reason for their admittance to special colleges in a greater rate.

Let us now see planned or actual student competition activity.

Table 9.
Logistic regression Exp(B)'s on actual or planned student competition activity, by the inclusion of material and cultural background indexes in separate steps (N=940)

Constant	0.337***	0.364***	0.726
Sex	1.412*	1.39	1.159
Material capital principal component		0.939	0.979
Number of siblings		1.185	1.422
Qualification of the mother			.949
Qualification of the father			1.016
Whether the mother reads regularly			0.515**
Whether the father reads regularly			1.247
Number of books at parents is above average			1.179
R_L^2	0.005	0.005	0.025

We marked the significance of the Wald statistics beside the Exp (B) values. *** marks significance below 0.000, ** marks significance between 0.001 and 0.01, * marks significance between 0.01 and 0.05. R_L^2 marks the fitting of the model (the decrease of -2LL in percentage).

Student competition activity are mostly conducted or planned by boys – fewer girls work on such studies, but the effect of gender disappears after the inclusion of background. Therefore,

in this case boys were in advantage only due to their better background. If we filter out the effect of a better background, there is no difference between boys and girls in planned or conducted student competition activity. (We can also see that, in an astonishing way, the reading habits of the mother affect student competition activity in a negative way, which can be explained here also by the fact that mothers read mostly popular literature.)

Let us now see the gender differences of teaching activity during the studies. We can trace boy advantage again, although the effect is not significant. (In this respect we will omit to present the data.) In a peculiar way, the chance for actual or planned teaching activity during the studies increased with the rise in the number of siblings, which can be explained here also by the fact that the more qualified siblings could motivate the student to do such activity.
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In the case of PhD plans, as efficiency index, the effect of the sex (and also the effect of other variables) was not significant, as only few students had such plans (the number of items is small). Nevertheless, it is clear from the data that there is a slight majority of boys over girls in planning PhD training (even if this relation is not significant). (In this respect we will omit to present the data.)

Finally, in the case of our last index, the actual and planned State Scholarship, there was no significant difference by gender either before or after the inclusion of background (we will omit to presentation of the data here, as well.)

Summary

Although there are still areas where girls are in disadvantage, (even in education, e.g. due to the horizontal and vertical segregation), we can state that there is an overall girl advantage in education. As we could see, girls are in majority in secondary and higher education, and in former studies of ours (Fényes, Pusztai 2006, Fényes 2008a) the male disadvantage hypothesis was supported. This hypothesis suggested that the social mobility of boys is smaller and their attempt on studying further in general high schools and in higher education is based on their better material and cultural background.

Besides the rates in education and the social mobility, there is another area where girls are in advantage, and it is school efficiency. At first, we studied the background of efficiency examinations. We discussed how the efficiency could be measured, and we also dealt with the role of factors affecting efficiency, the divergent efficiency of boys and girls, the differences of competence areas, and finally with the possible reasons for greater female efficiency in secondary level education. We found the reason for this in the success of the studying methods of girls, their better non-cognitive abilities, their greater self-discipline, their willingness to meet all demands (acknowledgement of others is more important for them), the greater pleasure they find in studying and finally their greater cultural activity (girls read more, and their cultural consumption is bigger).

In the empirical part of this paper, we examined the school efficiency of boys and girls with multi-variable methods, regarding the material and cultural background of the students, as well. In accordance with our hypothesis, girls are more efficient on secondary level in spite of their worse background indexes (they have more language exam certificates, better students' performance averages, bolder plans for further studies and more participation in student competitions). On tertiary level, however, the situation is not so simple. The advantage of girls is present at admittance – they outnumber boys in higher education, their high school

leaving exam results are better, they have more language exam certificates). Nevertheless, according to certain indexes (student competition activity, special college status, publication activity during the studies[11], PhD plans), boys take the lead in the subsequent years of studies (although, according to some other indexes – language exam certificate, further study plans – girls are still more efficient). These results already foretell the greater success of boys on the labor market, especially in the case of a scientific career. When boys decide to study further (and do not "waste themselves" in vocational schools), the plan for a PhD training and researcher career may gain more emphasis. We need to note, however, that in the case of one index (student competition activity during the studies) the greater efficiency of boys were only due to their better material and cultural background. (Thus in this case, the male disadvantage hypothesis we had discussed, is verified indirectly.)

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[11] Although, hereby we note that during the creation of these variables, the actual and planned activities were represented together. Therefore, the advantage of boys may have appeared only in the planning of these activities. But Pusztai's (2007) results show that the extracurricular workload (where the actual activities were examined, and the activities were measured with a composite index) was mainly a characteristic of boys, so the advantage of boys may have appeared not only in the planning of these activities, but in actual activities, as well.

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